

**WHAT IS CLAIMED IS:**

1. A hydrogen composition comprising:  
hydrogen gas; and  
an odorant, said odorant having a vapor pressure greater than 0.5 psi, having a smell detectable at less than 1 ppm by a human nose, and being in a vapor phase at detectable concentration at a pressure of 6000 psi.
2. The composition of claim 1, wherein said odorant is a selenium compound.
3. The composition of claim 2, wherein said selenium compound is ethylselenol.
4. The composition of claim 2, wherein said selenium compound is dimethylselenol.
5. The composition of claim 1, wherein said odorant is methylamine.
6. The composition of claim 1, wherein said odorant is trimethylamine.
7. The composition of claim 1, wherein said gaseous composition consists essentially of hydrogen gas and said odorant.
8. The composition of claim 1, wherein said odorant comprises 0.01 to 1000 ppm of said composition.
9. The composition of claim 1, wherein said odorant comprises 0.1 to 40 ppm of said composition.
10. The composition of claim 1, wherein said odorant is not harmful to humans.
11. The composition of claim 7, wherein said odorant has a minimum olfactory power of 7.0, a minimum vapor pressure of 0.5 psi at standard temperature and pressure, a minimum diffusivity of  $0.01147 \text{ cm}^2/\text{s}$ , and a maximum molecular weight of 200 g/mol.

12. The composition of claim 1, wherein said odorant is an oxygen compound.
13. The composition of claim 1, wherein said odorant is a nitrogen compound.
14. The composition of claim 1, wherein said odorant is a sulfur compound.
15. A method for detecting a hydrogen gas leak from a container comprising;  
providing a container containing a hydrogen composition; and  
detecting a leak from said container when the smell of an odorant present in said hydrogen composition is sensed, wherein said hydrogen composition comprises hydrogen and said odorant, said odorant having a vapor pressure greater than 0.5 psi, having a smell detectable at less than 1 ppm by a human nose, and being in a vapor phase at detectable concentration at a pressure of 6000 psi.
16. The method of claim 15, wherein said odorant is a selenium compound.
17. The method of claim 16, wherein said selenium compound is ethylselenol.
18. The method of claim 16, wherein said selenium compound is dimethylselenol.
19. The method of claim 15, wherein said odorant is methylamine.
20. The method of claim 15, wherein said odorant is trimethylamine.
21. The method of claim 15, wherein said gaseous composition consists essentially of hydrogen gas and said odorant.
22. The method of claim 15, wherein said odorant comprises 0.01 to 1000 ppm of said composition.
23. The method of claim 15, wherein said odorant comprises 0.1 to 40 ppm of said composition.
24. The method of claim 15, wherein said odorant is not harmful to humans.

25. The method of claim 15, wherein said odorant is sensed by a human.
26. The method of claim 15, wherein said odorant is sensed by a detecting device.
27. The method of claim 21, wherein said odorant has a minimum olfactory power of 7.0, a minimum vapor pressure of 0.5 psi at standard temperature and pressure, a minimum diffusivity of  $0.01147 \text{ cm}^2/\text{s}$ , and a maximum molecular weight of 200 g/mol.
28. The method of claim 15, wherein said odorant is an oxygen compound.
29. The method of claim 15, wherein said odorant is a nitrogen compound.
30. The method of claim 15, wherein said odorant is a sulfur compound.
31. A method of making a hydrogen composition comprising:  
providing hydrogen gas; and  
mixing an odorant with said hydrogen gas to form said hydrogen composition, said odorant having a vapor pressure greater than 0.5 psi, having a smell detectable at less than 1 ppm by a human nose, and being in a vapor phase at detectable concentration at a pressure of 6000 psi.
32. The method of claim 31, wherein said odorant is a selenium compound.
33. The method of claim 32, wherein said selenium compound is ethylselenol.
34. The method of claim 32, wherein said selenium compound is dimethylselenol.
35. The method of claim 31, wherein said odorant is methylamine.
36. The method of claim 31, wherein said odorant is trimethylamine.
37. The method of claim 31, wherein said gaseous composition consists essentially of hydrogen gas and said odorant.

38. The method of claim 31, wherein said odorant comprises 0.01 to 1000 ppm of said composition.

39. The method of claim 31, wherein said odorant comprises 0.1 to 40 ppm of said composition.

40. The method of claim 31, wherein said odorant is not harmful to humans.

41. The method of claim 37, wherein said odorant has a minimum olfactory power of 7.0, a minimum vapor pressure of 0.5 psi at standard temperature and pressure, a minimum diffusivity of  $0.01147 \text{ cm}^2/\text{s}$ , and a maximum molecular weight of 200 g/mol.

42. The method of claim 31, wherein said odorant is an oxygen compound.

43. The method of claim 31, wherein said odorant is a nitrogen compound.

44. The method of claim 31, wherein said odorant is a sulfur compound.